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SCHOOL AND SOCIETY

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THE EDUCATIONAL VALUE OF NATURE-STUDY*

Teachers of the natural sciences, in the secondary schools, are much concerned at the lack of knowledge displayed by the majority of their students regarding many of the simplest phenomena of nature. Because of this ignorance, much valuable time is consumed in preliminary work, before any serious study of the natural sciences can be undertaken. This paucity of information pertaining to the common facts of nature, combined with false ideas concerning the natural processes in the immediate environment, is a most serious impediment to real scientific study and to actual scientific progress. Comparatively few students, entering these schools, have learned to form either inductions or deductions from observed natural phenomena; and the interpretations of those who have learned a method of induction or of deduction are frequently erroneous. Teachers and students alike should realize that it is just as possible to make false interpretations of observed natural processes as it is to interpret wrongly passages in elementary English literature or principles in introductory mathematics.

There is probably no branch of education, in the graded and other elementary schools, that has been so much slighted and carried on with so little intelligence or motive as that of nature-study. Such a condition is a very unfortunate one, because, of all the things that young people learn, or should learn in the schools, there is none that will give them greater satisfaction or that will be of more outstanding value to them throughout life than the ability to interpret properly the common physical and biological processes of their own environment. In this connection, a statement by Trafton,[1] quoted by him from the *Nature-Study Review*, is of interest:

> The love of nature aroused in that schoolroom under the guidance of a teacher who was herself a lover of the fields and woods has given more pleasure than all else in life combined.

It is a matter to be regretted that this neglect of nature-study is so prevalent in large sections of North America, both in Canada and in the United States. This statement is made with knowledge of the improvement and progress that have been made in behalf of nature-study during recent years. There is still a dearth of well-trained teachers of this subject, and it is frequently taught in a most perfunctory manner. In many of the elementary and graded schools the curriculum makes little or no provision for the presentation of this essential topic. In other schools, a meager amount of so-called nature-study is taught in connection with reading, geography or some other part of the required work of the curriculum. But nature-study, as such, does not receive much serious attention, certainly not as a laboratory or outdoor subject.

It is fully realized that there must be preliminary training in mathematics, English and history prior to the more advanced work of the high schools, other secondary

* The writer was formerly the head of a large department of biology and nature-study in a state teachers' college. Therefore, he was in a position to understand the various problems involved in the teaching of nature-study, in its development and in the preparation of teachers of this subject.

[1] Trafton, G. H., "The Teaching of Science in the Elementary School," Boston, Houghton Mifflin Company, 1918, p. 5.

schools and the normal schools; but this does not appear to be true regarding the natural sciences. However, this fact, apparently, has been recognized, to some extent, in a number of high schools; for there has been introduced a hodgepodge known as elementary general science, which appears to be a partial substitute for work that should have been done in the graded schools, and a partial preparation for the more serious study of the high school sciences. Many young people enter the higher schools possessing few ideas which either properly coordinate or properly correlate with the natural sciences. These are new subjects to them, for the study of which the minds of the young students have not been properly prepared. Not having been grounded in the elementary facts of the natural sciences—which should have been incorporated in a correctly balanced course of nature-study throughout all the public schools, from the kindergarten, through the various grades, to the conclusion of the eighth grade—the result is that the young students are unable to attack these subjects either with proper appreciation or with proper efficiency, on account of not having been trained in the necessary sort of thinking. While it is true that certain of the various attributes of the child's mind have received some training, nevertheless, in many schools, word and book memory have occupied too great a share in the regular work of the grades. There has been too little training in observation and interpretation, which is decidedly evident when the young people first enter the high schools and are introduced to the laboratory phases of the natural sciences. The laboratory method of approach to the study of these subjects—that invaluable pedagogical and scientific procedure, even for the immature—demands observation, interpretation, induction, comparison and accuracy if it is to be effectively pursued.

It is only within comparatively recent years that nature-study, as a required subject, has received serious consideration from those who have in charge the planning of and placing in operation of the curriculum in the elementary and other graded schools. A decade and a half or so ago, there was but a little work in nature-study of a really satisfactory character being accomplished in these schools. In fact, in a great many such schools, this work was of such mediocre quality that the time devoted to it might much more profitably have been bestowed on some other subject. Even at the present time, it is only in comparatively few schools that nature-study ranks in importance with geography, history or English. Young students still enter the high schools and many of the normal schools, knowing little or nothing regarding the elements of botany, zoology, physics or chemistry, and very little of physiology, or of any other of the sciences. Such a situation does not provide a satisfactory preparation for an introduction to the high school sciences. In fact, it is entirely at variance with a condition that should stimulate scientific training, and assist in developing scientific advancement. Furthermore, it omits from consideration a subject that is fundamentally important in the life of the child and of that of the adult. It is encouragingly true that some improvement has been made, and yet nature-study is far from being accorded the prominence it deserves, and will eventually certainly achieve. More and better work in this subject is needed in the graded schools, with better presentation and more carefully trained nature-study teachers, and, finally, the subject should be accorded a dignified place and suitable prominence in the curriculum of the schools.

It is, of course, possible to enumerate a number of city school systems, both in Canada and in the United States, in which good work in nature-study is being accomplished in the graded schools. In certain

of the larger cities there is a director of nature-study, with the necessary specialized training, who supervises this subject and is generally responsible for its success in the schools. In the graded schools of these cities, there are often found teachers who have been reasonably well trained in nature-study at the municipal and state normal schools. It is encouraging to know that some of the state normal schools and state teachers' colleges are now offering courses that present satisfactory training for teachers of nature-study. In several states, the natural sciences in the secondary schools, particularly in the high schools, have reached a far higher standard of efficiency and development than is the case in other states. There are a number of factors that seem to offer explanations for this higher standard of the natural sciences in the high schools of certain states. A few that appear to be the most pertinent will be mentioned: Careful and efficient high school inspection by qualified and competent educational officials has undoubtedly been one factor; well-organized state normal schools and state teachers' colleges that offer suitable courses for graded school teachers of nature-study and for high school teachers of the natural sciences has been another factor; the influence of inspiring and efficient teachers and organizers of the natural sciences in some of the state universities and other state educational and scientific institutions has been still another powerful factor; although these factors have been very influential in fostering the progress of the natural sciences in the high schools, it is doubtful whether there has been any factor more stimulating to these sciences than that of carefully organized courses of nature-study, efficiently presented by thoroughly trained teachers in the graded schools. Therefore, more attention should be devoted to nature-study, and more comprehensive instruction should be provided in this subject throughout these schools. When such a condition prevails, it is obvious that the natural sciences of the high schools will be on a more secure foundation, and that the educational results achieved in these schools will be of a better quality and of a more permanent character.

Many reasons might be enumerated in order to explain the present unsatisfactory status of nature-study. Probably the most significant one is the fact that the full consequence of this subject in its bearing upon the life of the child has not been fully recognized. The study of nature is of greater importance than simply as a means by which the child can obtain direct and definite information about the physical and biological factors of his environment, valuable as these are. It will aid him in developing a skill, or an ability, that should assist him in controlling, in a measure, his own environment, and also, to some extent, in compelling it to subserve his own necessities. When nature-study is regarded from this aspect, the fact is evident that it becomes something far more than a mere adjunct, or aid, to other school work, as many teachers seem to consider it, for the study of this subject then presents itself as a real preparation for life, and hence is definitely practical, for life is indeed practical.

Notwithstanding the fact that the status of nature-study in the graded schools is not, at the present time, equal to that of many of the other subjects of the curriculum, it is gradually receiving more favorable consideration. It will, eventually, be accorded a place corresponding in dignity to its value as a factor in the general scheme of elementary and graded school education. Some of our educators, more particularly instructors in state teachers' colleges and in university schools of education, are beginning to appreciate its importance, and also to emphasize its significance as a factor in the school curriculum. There is at least one tangible manifestation of

this, which is indicated in the character of a number of the nature-study text-books, and text-books of a closely related description, published for the use of teachers and prospective teachers of this subject, and that are being used in some of the state and provincial normal schools and state teachers' colleges. This is evinced in the general content and special viewpoint of such text-books as those written by Scott[2], Hodge[3], McMurry[4], Holtz[5], Comstock[6], Trafton,[7], Downing[8], Bailey[9] and others, for there is recognition of the rôle played by certain principles of educational psychology as applied to the child and adolescent youth. The responses and mental processes of the child are considered, such consideration being demonstrated not only in the choice of subject-matter and method of presentation, but also in the introduction of the proper aim, correlation and motivation of nature-study.

At the present time, this subject appears to be limited to the study of the elements of botany and zoology in many of the graded schools. Even in a number of the state normal schools and state teachers' colleges the content of courses for prospective teachers of nature-study is mainly biological. This may seem to be a consideration of the subject from a rather restricted aspect, or rather, a consideration of but one of its many phases. For the immediate present, perhaps, this condition is permissible; but as soon as the facilities of any school permit, other phases of nature-study should be introduced, such, for example, as simple observations of and demonstrations in chemistry, physics and physiology, and also the consideration of the elements of physical geography, astronomy and meteorology, because children are interested in all the phenomena of nature that their observation dwells upon in daily experience. They ask questions concerning many varied processes in their immediate environment. How varied these interrogatories may be is indicated by the following range of topics: These include inquiries about minerals, rocks and the different varieties of soil; water in its different forms; fire, gases and smoke, also their end and by-products; combustible substances, both specific and general, and the various manifestations of electricity. An extended list of questions, asked by children relating to natural phenomena, was given to the writer by the director of the training school in one of the Minnesota state teachers' colleges. The following have been selected in order to disclose their diversity and distinctness of type: "Why is the grass greener just after the snow melts, and pale in color after a plank has been on it for some time?" "What makes the wheels of a motor go round?" "Why do not the andirons burn, as well as the wood in a fireplace?" "Why does smoke fall to the ground before a rain?" Such questions as the foregoing give us an insight into the operations of the child's mind. They aid us, in some degree, in comprehending the really complex activity of his consciousness. The world about him is teeming with innumerable and complex stimuli; and his rapidly develop-

[2] Scott, C. B., "Nature-Study and the Child," Boston, D. C. Heath and Company, 1900, pp. XXV + 618.

[3] Hodge, C. F., "Nature-Study and Life," Boston, Ginn and Company, 1902, pp. XVI + 514.

[4] McMurry, C. A., "Special Method in Elementary Science," New York, The Macmillan Company, 1904, pp. VII + 275.

[5] Holtz, F. L., "Nature-Study," New York, Charles Scribner's Sons, 1908, pp. XIV + 546.

[6] Comstock, A. B., "Handbook of Nature-Study," Ithaca, Comstock Publishing Company, 1912, pp. XVII + 938.

[7] Trafton, G. H., "The Teaching of Science in the Elementary School," Boston, Houghton Mifflin Company, 1918, pp. X + 293.

[8] Downing, E. R., "A Source Book of Biological Nature-Study," Chicago, The University of Chicago Press, 1919, pp. XXI + 503.

[9] Bailey, L. H., "The Nature-Study Idea," 4th ed. rev., New York, The Macmillan Company, 1920, pp. IX + 246.

ing mentality is a fertile field for reaction processes. Therefore, it is imperative that the teacher of nature-study should adapt the content and motivation of this subject to the mental deviations of the child.

The social instinct is prominent in the child and adolescent youth. This instinct should be employed as a guide in nature-study work. By such means he may be aided in adapting himself to his own environment. Assisted by this instinct, the child learns to interpret and understand many of the phenomena of nature in their application to the social and industrial life about him. Through his understanding of the practical application of some of the elementary facts of the natural sciences, interest is sustained and developed, and the result is that the child desires to impart his information to others. This tends to make him useful to his associates and eventually to take his proper place as a helpful member of society in his own community. Trafton[10] indicates in the following quotation that the child's daily experiences are closely interwoven with his social life and duties:

> Children's experiences abound in social life and its corresponding duties. The child's play life is largely a social life. To even a larger extent than the adult, children are together in their various activities. And in these gatherings there arise the same problems that arise in adult gatherings; leadership, duties to each other, the establishment of a basis on which intercourse is possible, the punishment of those who offend these requirements, and so on through a long list of social activities.
>
> And so from morning till night the child's day is full of its activities and needs, quite as varied as those of the adult, and offering equal opportunities for the application of useful knowledge. The school should seek to give the child the things that these present activities demand.

If children are properly taught how to interpret the common phenomena of nature, and to understand the structure of various plants and animals, and the relations of these to the environment, their daily activities will be enriched and better adapted to social life. Such teaching and study tend to affirm, in a large measure, our dependence upon nature for many of our important necessities. Children who obtain a true appreciation of their natural environment, through the influence of nature-study, will neither abuse nature nor waste its resources. As they reach adult life, they will have a strong influence on community thought and conduct with respect to such matters as have a bearing upon the varied resources of nature in their own state or province.

In addition to the social instinct, there is another instinct strongly developed in the child, and that is the powerful instinct of curiosity. Attention has been directed to the fact that the social instinct may be utilized in directing the child in his study of nature. In a somewhat similar manner, the instinct of curiosity may also be so guided that it can be made to serve a useful purpose in nature-study. In the case of many children, this instinct brings them in direct contact with nature, and it is, very frequently, the principal impulse for the development of their interest in the natural objects and processes of the immediate environment. Holtz[11], a leading writer and teacher in the interest of nature-study, directs attention to the child's instinct of curiosity, and to its importance in connection with the teaching and study of this subject. He states that:

> The child wonders about the objects and phenomena of nature; he is curious about them, perhaps for no reason except that they attract his attention. He feels that he must know what and why these things are, and this irrespective of any consideration of the usefulness or applicability of the knowledge to himself or to society. In much the same way the adult scientist craves a satisfy-

[10] Trafton, G. H., "The Teaching of Science in the Elementary School," Boston, Houghton Mifflin Company, 1918, p. 28.

[11] Holtz, F. L., "Nature-Study," New York, Charles Scribner's Sons, 1908, pp. 6, 7.

ing explanation of, or insight into, many facts of nature. I believe this powerful impulse should not be neglected in education, though it may be carried too far and lead to mere book learning, with a disregard for the fact, that, in general, knowledge should be a means and not an end in itself. . . . Through this curiosity we learn of many interesting and beautiful relations in the natural world. We find that a unity prevails and we discern a plan more or less clearly. In short, this impulse arising from curiosity finally places the individual in harmony with the natural world and adds in a great measure to general culture.

This harmonizing of man and nature is an essential element in education. It must not be forgotten, however, that much of this knowledge gained from curiosity or—to use another expression—in the search for truth may later be found to be of great, perhaps the highest, practical value. Through this everlasting spirit of inquiry many important facts and principles have been discovered, and the field of human vision widened. . . .

If we utilize as we should these natural interests or innate impulses of the child, we have enough of stimulus or motive to vitalize nature-study.

This craving for information, on the part of the child, must be satisfied, but it needs to be properly directed, in order to be beneficial to him. He should be permitted full freedom to investigate nature in his own environment, in any direction that his interests suggest, just so long as these interests are correctly utilized.

Imagination plays a large and important rôle in the lives of children. Because of this fact, it should receive careful consideration by teachers, when planning and presenting the subject-matter of courses in nature-study. It should be one of the major facts in deciding upon the method, aim and point of view of this subject. At this point, it may, perhaps, be useful to state just what is meant by the term imagination. A quotation from Scott[12], an active and authoritative exponent of the nature-study idea, defines this term in a satisfactory manner:

[12] Scott, C. B., "Nature-Study and the Child," Boston, D. C. Heath and Company, 1900, p. 159.

The power or the process of repeating or reproducing the images of what has been perceived and apperceived is memory. The power or process of relating and combining these images, selecting parts of some, adding to others, combining parts of several to form a mind picture of what has not been perceived, we call imagination. The distinction between memory and imagination as thus defined is not very sharp. Frequently imagination is considered as including both memory—then called reproductive imagination—and imagination proper, distinguished as constructive imagination. Both have a most important part in determining method in nature-study or in any other subject.

Nature-study develops imagination in children, for, as they learn to observe and interpret natural phenomena, they perceive the wonders and truthfulness of nature, and this stimulates the imagination to a degree equal to that of any strange mythological story or fanciful tale of fiction. Therefore, this faculty must not be ignored by the teacher of nature-study—rather should it be encouraged when properly controlled. As McMurry[13] has well said:

To shut out the use of imagination in nature-study is doing violence to a child's nature, for all his thoughts naturally assume imaginative forms in early years. How flat and insipid would any nature-study be which tries to bind down a child's thought to what is manifest to the senses? He can't see the plant grow. He only sees that changes have taken place, and reason and imagination must help him to the rest. . . .

It is certainly the business of nature-study to teach children to observe accurately and to have an honest respect for the facts; but in reaching forward to the laws and unities, in interpreting the phenomena of organic and of inorganic matter, the imagination is indispensable.

Nevertheless, it is necessary to impress this fact on the young students of nature, that they must learn to govern the imagination by checking it with the definite objects and processes of nature in their own environment. Attention has been directed to the fact that the instinct of curiosity is very strong in children, and may be utilized

[13] McMurry, C. A., "Special Method in Elementary Science," New York, The Macmillan Company, 1904, p. 115.

in nature-study, but that it must be guided along the proper channels. Imagination is also a powerful mental faculty in the life of the child, and there is opportunity for its generous exercise in the study of nature. However, as with the instinct of curiosity, it requires to be intelligently directed. If the instinct of curiosity should not be guided by correct training, there is danger that imagination will lead the child astray, and give rise to erroneous mental conclusions. This is unfortunate not only from the standpoint of science, but also from that of child psychology. The result may prove disastrous in its consequences, and in some instances may have a modifying influence on the whole after life of the individual. This is especially true when fear or some other unpleasant fundamental instinct acts as a stimulus upon the imagination. Certain forms of stimuli react so strongly upon children, and the resulting effects are frequently so vital and so far-reaching that even the most simple and harmless natural phenomena require to be carefully explained at this period of mental development. Should these phenomena prove to be more or less enigmatical and displeasing, there is the greater necessity for their elucidation. The instinct of fear, especially as modified by the apparently mysterious processes of nature, is without doubt one of the most fundamental factors in influencing the young and immature mind. Objects, processes and products of nature, if fully understood, are usually deprived of their most harmful mental stimuli. The unknown, the strange, having been made plain, fear is subordinated, and the result is that the opportunity arises for instincts of a more ameliorating character to become dominant.

Attention has previously been directed to the fact that certain educators, especially instructors in state teachers' colleges and in university schools of education, are cognizant of the importance of nature-study as a factor in the graded school curriculum. However, there is still needed a fuller realization of the influence of nature-study upon the life of the child in connection with his every-day experience and observation. Therefore, because of the important bearing of nature-study on the life of the child, it is essential that the teachers of this subject be carefully trained, in order that they may be not only sympathetic in their attitude toward nature-study, but also accurate in their presentation of the subject. Bailey[14] presents a similar idea in the following words:

> We need the very best of teachers for nature-study—those who have the greatest personal enthusiasm, and who are least bound by the traditions of the classroom. The teacher, to be ideal, must have more time, more feeling and more knowledge.

The importance of thorough preparation on the part of the teacher can scarcely be overemphasized, for there are few tasks quite so difficult as the explanation of scientific principles to children. Within certain limits, it may be considered axiomatic that the younger are the children, the greater is the necessity for thorough training on the part of the teacher of nature-study. A proper mastery of the subject is essential, if natural processes are to be clearly presented by the teacher and explicitly understood by the child.

It is necessary for the teacher of nature-study to guide the child in his observations and interpretations of natural processes in order that the young student will assume the proper attitude toward his own environment and toward the whole of nature. The child, if correctly taught, should find nothing revolting to his senses in such animals as the spider or the toad. The former should be admired for its agility and won-

[14] Bailey, L. H., "The Nature-Study Idea," 4th ed. rev., New York, The Macmillan Company, 1920, p. 39.

derful silk-spinning instinct, and the latter for its services to man and the beauty of its eye. In this connection a statement by Hodge[15] is of interest:

> I pick up a toad a hundred times a season just to enjoy looking at its eye—a living, sparkling, ever-changing jewel—and his music in the spring-time brings a pleasure that nothing else affords.

Therefore, the child can be shown that there is both beauty and utility in the toad—an animal which to many people is both ugly and repugnant, and against which they are strongly prejudiced. Regarding the utility of the toad, there are few animals that are of greater use to man. Another quotation from Hodge[16] indicates the great economic value of this animal:

> Further than this, the school children might save in the course of their outdoor laboratory work and play from $100,000,000 to $200,000,000—nearly half the expense of their entire public school education—by learning and utilizing this one species as a beneficent force in nature; and the effect will first be felt in their own gardens.

Hence, it is extremely important that children acquire the proper point of view toward nature. Thousands of toads and other useful animals are slaughtered annually by boys. Extensive and indiscriminate destruction of small animals by young men and boys has frequently been observed by the writer. Such wanton abuse of animal life requires an explanation and if possible a remedy. Other observers have noticed similar facts and Hodge[17] again may be quoted in this connection:

> My attention to this subject, and in fact, to nature-study in general, was aroused by the wholesale killing of toads when they came to the ponds to lay their eggs. While walking once around a small pond, I counted two hundred dead or mangled and struggling in the water, and learned next day that two boys had killed three hundred more, carrying them off in an old milk can to empty on a man's doorstep. This five hundred does not represent probably one tenth of the number killed by the children that spring (1897) around this one pond. A "civilization" in which such abuses of nature are possible ought to be eaten alive by insects, and something must be fundamentally wrong with a system of public education that does not render such a thing impossible.

An explanation for such apparent ruthlessness will be offered later. A remedy was employed by Hodge which proved to be efficacious. His first impulse was to direct his energy toward the passing of a prohibitory law, and to appeal to the police. However, with fine discrimination, he followed another plan, and that was to instruct children and to guide them to a proper appreciation of nature. A prize was offered in the city of Worcester, Massachusetts, where the slaughter occurred, to the school child who made the best practical study of the "Value of the common toad." Excellent results followed, for the prize was offered on March 31, 1898, and during the following April and May, there was no evidence that a single toad was killed at the pond. Hodge states that he would have been well satisfied had this result been accomplished in five years, but the fact that such satisfactory results came within thirty days discloses the influence of nature-study when it is correlated with human interests.

The destruction of animal life that has been recorded above may be the result of ignorance, of fear or of the instinct of savagery or possibly a combination of all three of these. An explanation of these harmful responses of children and particularly of boys that has often been proffered is that they are the inheritance from a savage ancestry. Much has been written about the boy as a young savage by the educational psychologists, and this is explained

[15] Hodge, C. F., "Nature-Study and Life," Boston, Ginn and Company, 1902, p. 290.

[16] Hodge, C. F., "Nature-Study and Life," Boston, Ginn and Company, 1902, p. 291.

[17] Hodge, C. F., "Nature-Study and Life," Boston, Ginn and Company, 1902, p. 292.

as a stage through which the race has passed in its development and through which the boy is now passing. Regarding this point of view, Holtz[18] makes the following statement:

> It has become an educational maxim that the mental evolution of the child corresponds in a measure to the mental evolution of the race to which he belongs. That is, the child exhibits mental traits that were once characteristic of his race when in the primitive stage. In pedagogy we hear this spoken of as the Culture Epoch Theory, and though it is not fully worked out in its applications, this theory is already useful in education. We can not safely change the course of nature in the development of mind and body. It is better to take a suggestion from nature and to work with, rather than against her.

The instinct of savagery can be guided and it may be modified in such a manner that it will not express itself in cruelty. The teacher should take advantage of the boy's instinct of inquisitiveness—that has previously been discussed—regarding natural objects and processes, and by means of this instinct to develop in him a proper interest in nature-study, which should lead, eventually, to a true value and appreciation of the whole of nature. He likes to play games—to play Indian; he is devoted to fishing and hunting. All these interests should be utilized in directing him to view plant and animal life as parts of his environment that are to be protected and not to be destroyed. He can be interested in caring for animal pets, birds and plants, and thus his inheritance from a savage ancestry may be modified and guided along paths of kindness and usefulness until at length he develops a genuine love for the many living and non-living elements of his natural environment.

If the above suggestions are put into practice, children will view nature from a more sympathetic and appreciative aspect. There will be a greater desire to protect animal and plant life and a smaller desire to destroy it. Many persons never acquire the proper point of view toward nature, because of the fact that they were not taught correctly as children. Some people still kill snakes at all times and without any provocation other than that of an unreasoning fear, neither realizing their inoffensiveness nor their enormous economic value to man. Further, they do not understand that this wanton destruction of one form of life affects materially other organic forms so vitally that parts of the machinery of nature may be thrown out of gear and their relative equilibrium disturbed. Such destruction of animal or plant life at one point in the environment results in disturbances or conditions of stress at other points. Fortunately, however, nature possesses such remarkable powers of recuperation, through her varied processes, that these conditions of stress tend to change, in consequence of their response to pressure in the environment. Then follows a readjustment or process of adjustment to strain, this in turn being followed by a condition of relative equilibrium. Adams[19] has developed this idea in a suggestive paper. The fact has previously been mentioned that children destroy animal and plant life, either through ignorance or fear, or through a combination of both of these factors. In order to offset this, the mind of the child should be so directed that he responds to nature as he would to a pleasant stimulus. He should be taught to recognize use and beauty in the environment about him, where before he may have seen but the useless and the grotesque. If children were trained to respond rightly to nature, they would decry the wholesale slaughter of game, both birds and mammals, which is so common at the present time. The result would be that,

[18] Holtz, F. L., "Nature-Study," New York, Charles Scribner's Sons, 1908, p. 10.

[19] Adams, C. C., "An outline of the relations of animals to their inland environments," *Bulletin Illinois State Laboratory Natural History*, Vol. XI, pp. 1–32, 1902.

when they reached maturity, their influence would undoubtedly be exerted in behalf of the present movement to preserve our wild animals. The writer believes that if there had been years ago more nature-study of the out-of-door character taught in the schools, many of the animals now extinct and others almost extinct would still be found in great numbers.

The teacher of nature-study needs to inculcate living truth, and also to uproot the influence of inherited errors, and the latter is much the more difficult. Children must be taught the truth not only regarding the laws of nature, but also regarding the objects and processes of their own environment. As thorough an insight and appreciation of nature as possible is necessary to children, if they are to be properly adjusted to the surroundings in which they live. They should be given at least as much knowledge of the underlying principles of inorganic and organic forces, processes and products, as their minds can assimilate. In this connection a quotation from McMurry[20] may be of interest:

> We may state the broad aim of science studies as a responsive *insight into nature* with a view to a growing adjustment to the physical and social environment. It is an interested understanding of the materials and activities of the world's great workshop, an appreciation of the variety, beauty, harmony, and law of nature's handiwork. If a child is to reach maturity with a proper insight into physical laws, forces, products, utilities and inventive appliances, he must begin early to train his eye and his understanding to look into these wonders.

Sometimes it may be necessary to exert vigorous efforts in order to free the minds of children from superstition and fear of natural phenomena. Fear of any object or process of nature is a heavy burden to carry through life. Nature has always been more or less of a mystery to mankind. Throughout the ages, man has, at different times, enjoyed, worshipped and feared nature and her manifestations. Various forms of idolatry are still found to be extant among many primitive peoples. The various forces of nature, such as the wind, thunder and lightning, and also the planets, the sun and the moon, for example, have been feared and venerated during different stages of man's religious development. The growth of science has been slow, largely because of superstition and prejudice. Relatively, it is not so long ago that chemistry was looked upon with intolerance, and it was considered so uncanny an occupation that it was called the black art. Unfortunately, few of us are entirely exempt from the influence of certain superstitions, and not infrequently these are almost as primitive as some of those of our savage ancestors. Hence, it is not surprising that children, although possessing a strong innate interest in nature, should find much that is mysterious and grotesque pervading their natural environment. Many boys have a disregard for animal life and destroy it under slight provocation—a form of cruelty probably based upon ignorance of the functions of living creatures and upon groundless fears. From early childhood the notion is implanted, and it seems to be practically instinctive, that in many living things of the immediate environment and especially of the animal kingdom, there is some secret danger to the boy's well-being, or even to his life. Perhaps this is to be explained as a phase that has been passed through in the development of the race, and which is now being duplicated in the development of the individual. If children were taught, sufficiently early, a proper viewpoint of nature, there would be less destruction of animal life, and possibly it might be stopped altogether. A condition of proper mental adjustment toward organic life and toward the general environment may be effected by a correct study of nature and a sound interpretation of its

[20] McMurry, C. A., "Special Method in Elementary Science," New York, The Macmillan Company, 1904, p. 12.

processes. This point of view can be obtained only by a scientific appreciation of natural phenomena as realized through nature-study.

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COLLEGE QUALIFYING EXAMINATIONS

I. THE COLLEGE QUALIFYING EXAMINATION: ITS DEVELOPMENT

THE present knowledge and emphasis on the rôle of individual differences in mental and educational abilities renders it imperative that college administrators shall not lag behind public school officials in the application of these newer discoveries to the internal problems of student guidance and placement. The rapid increase in university enrollment is an added incentive to action lest the individual suffer from easily preventable disadvantages arising in mass education.

An important step in individualizing the education in large universities is the introduction of the college qualifying examination.

During the past five years a large number of colleges and universities have made what was then thought to be radical departures by the introduction of entrance or qualifying examinations. Prior to about 1918, in those schools making use of entrance examinations at all, the entrance examinations had been almost wholly concerned with determining the general academic fitness of the applicants. In a word, they were educational examinations based very largely upon the achievement normally expected during the four-year high-school course. When it began to be increasingly apparent that these traditional written examinations were greatly invalidated by unavoidable errors due to the subjectivity and personal equation involved in the scoring of such papers, search was begun for a substitute procedure which would obviate these sources of unreliability. Due to the historic turn of events following the World War and the consequent production of group tests of mental ability for use with adults, substitute procedures were made readily available. The objectionable subjectivity of the earlier written examinations was practically eliminated. The administration and scoring of the new group intelligence tests was found to be accurate and economical, with the result that to-day between fifty and one hundred colleges and universities are giving some sort of mental tests or intelligence tests as a regular part of the program of matriculation, although not necessarily as a basis for the selection or rejection of college applicants. In most of these schools the primary purpose of the tests is chiefly experimental in nature.

The general effect of this change has been a decided improvement. Reports from a large number of institutions have appeared which give ample justification for the continued use of these newer types of examinations. There is one point in the general logic of the situation, however, that has not always been clearly conscious in our thinking, *viz., that we have shifted the basis of prediction of collegiate success* (for prediction is the primary aim of entrance examinations) *from that of academic or scholastic fitness to that of "native" ability.* In other words, we have substituted *mental* examinations in the place of *educational* examinations. The improvement which has undoubtedly resulted has been due to two things: (1) That objective mental tests are more reliable in the technical sense that they are freer from errors of measurement, and (2) that general mental ability or intelligence is a fairly good measure of learning capacity. The careful thinker is likely to raise the issue of the relative

values of educational versus mental measurements for the purpose when both are so constructed that errors of measurement are minimized beyond practical significance. Would the mental test prove a better instrument of prediction than a carefully constructed and entirely objective examination based upon the significant elements of the high-school curriculum? The answer is not certain. High-school grades as ordinarily given do not equal in value the results of mental tests at college entrance. The reason is the same as in the case of the written educational examinations already mentioned, *i.e.*, subjective errors of measurement.

The logic of the situation would seem to imply that the best measures of prediction should involve batteries of tests of both general ability and past educational achievement. As far as the writer is aware, no one at the present time could state certainly whether a valid examination on the high-school curriculum lasting 60 to 90 minutes with a reliability of 0.90 will correlate less highly, equally or more highly with college success than an intelligence examination requiring the same amount of time and possessing the same reliability. Regardless of the answer, it would most certainly result that a test of the nature of the first-mentioned would contribute additional refinement of prediction over and above that of the intelligence examination alone. This, at any rate, is the common-sense answer. Statistically, if the intelligence test correlates 0.60 with college success and the educational test correlates 0.60 with the same criterion, and these two tests correlate 0.50 or less with each other, it can be shown readily by the multiple correlation formula that the use of the educational test will raise the accuracy of prediction to an important extent.

II. The College Qualifying Examination: Its Scope

An analysis of the abilities and conditions basic to college success would include a variety of factors; the following, at least, being fundamental:

(1) *General mental ability;* variously termed "intelligence," "mental alertness," "capacity to learn," etc.

(2) *Previous academic training.* This is equivalent to an inventory of the skills and knowledges with which the student is equipped at his matriculation at college. In addition to purely factual mastery are many specific skills like the ability to read textual materials with comprehension, efficient habits of attention and study, scholarly "instincts" and interests, etc.

(3) *Volitional, emotional and personality* factors essential to efficient college work.

(4) *Records of the social, economic and general home conditions* which have operated upon the student prior to college enrollment.

The foregoing catalog is suggestive rather than exhaustive, but it will serve to outline the general possibilities of the method. The first two and the last, at least, can be realized in large measure at the present time with careful application of recent psychological techniques. Section IV will be devoted to an outline of a practicable procedure.

III. The College Qualifying Examination: Its Function

The waste in higher education through maladjustment and misdirection of student placement to-day is appalling. A considerable percentage of pupils entering college each year must be eliminated after one or two semesters' trial. It is not at all unusual for this shrinkage to equal twenty-five to fifty per cent. during the first year and from fifty to seventy-five or more per cent. from the freshman to senior years. Surely a considerable part of this "lost motion" is preventable by the use of scientific methods. One important tool is the college qualifying examination.

Logically such examinations should be given at the close of the high-school period and before the student has actually undergone the expense of entering college. Preferably, the examinations should be standardized upon a nation-wide basis and administered in a large number of centers throughout the United States.

Student, parent and teacher should be granted the opportunity for a scientific assay or estimate of the fitness of the prospective student. The important thing is that such *estimates be obtained in time.*

Two institutions at least have taken important steps in the direction we have outlined, *viz.*, Stanford University and the State University of Iowa. The former now holds intelligence examinations for high-school graduates in a large number of centers in the state of California and in the larger cities throughout the United States as a basis of admission to the university. Critical levels for rejection of applicants have been specified. The State University of Iowa has been conducting for two years past a series of qualifying examinations for the graduates of twenty-five or thirty high schools of the state. The evidence thus gathered is to be supplemented by a carefully planned follow-up program of the individual students, such information as college attendance or non-attendance, reasons for not attending college, basis of choice of college, academic success, success in vocations, etc. The underlying aim of this program is the formulation of a rational basis for vocational guidance. This experiment will be continued for at least five years in order that ample opportunity for each phase of the program studying will be afforded. Similar studies of individual academic histories and special student problems are proceeding within the university proper. The graduate council of the university appoints annually two or more research assistants who carry forward both of these projects with the active cooperation of the dean of the graduate college, the dean of the college of liberal arts, the deans of men and women, the registrar and the writer. The combined projects involve approximately three thousand students annually and a number of investigations have been completed to date on student personnel problems. For the present academic year, problems in the prediction of engineering success will receive the major attention. Results of these investigations are published from time to time.[1]

IV. The College Qualifying Examination: Its Nature

The potential scope of the qualifying examination was outlined in Section II. The Iowa program as it has evolved up to the present time has successfully met the first two requirements, *viz.*, tests of general mental ability and tests of previous academic training and fitness. These will be described briefly in closing, the qualifying examination of 1924–5 forming the basis of our description. The series for the current year involves:

(1) A general "intelligence" test, *viz.*, the "Thorndike intelligence examination for high-school graduates," Part I, Form B.

(2) A test of reading comprehension, the "Iowa comprehension test," D-2.[2]

(3) A test of knowledge of the high-school subjects, the "Iowa high-school content examination," Form B.[2]

The Iowa comprehension test consists of three passages selected from materials suitable for inclusion in college text-books in English, history and science, respectively.

[1] *E.g.*, Ruch, G. M.: "A mental-educational survey of 1,550 Iowa high-school seniors," University of Iowa Studies, First Series, No. 72, December 1, 1923, pp. 1–29.

[2] Samples may be obtained from the Extension Division, State University of Iowa, Iowa City, Iowa. All these tests are available for general use. New forms are produced annually.

The student reads the passages selecting numbered passages which answer questions, 12 to each selection, based upon the material read. This type of test has been proved to be highly predictive of college success. New forms are provided annually. The correlations with college grades are above .50 for a single semester's work.

The *Iowa high-school content examination* is composed of four hundred multiple response items covering the four major groups of high-school subjects, *viz.*, English, the social sciences, the natural sciences and mathematics. A range of scores of more than three hundred points is found among the members of a single entering class. The reliability of this test has been figured at .95 and its correlation with a single semester's marks is above .50.

Both of these new events are purely objective in scoring and easy to administer in groups of five hundred or more students.

The composite ratings of the three units of the battery correlate at least .60 with a single semester's mark in college courses. That this is relatively a high prediction is shown by the fact that college grades are not a very reliable criterion for prediction, since the marks themselves correlate less than .75 when one semester is compared with another. The correct weighting of the three test units has been guaranteed by multiple correlation methods.

The results of the qualifying examination have come to be regarded as highly significant by those university officers and committees who are in touch with personnel problems.

G. M. RUCH

STATE UNIVERSITY OF IOWA

CHARLES HENRY KEYES[1]

THE most striking characteristic of Charles Henry Keyes was his exceeding love for his friends. He was by temperament utterly unwilling and unable to see anything wrong or imperfect in us. This "blind spot" in an otherwise clear intellectual vision applied alike to our appearance, our manners, our intelligence, our morals, and all else that was ours. To his mind there simply was no defect that could possibly be detected in any one that he had come to love.

Probably most of us for whom he cared are no worse than the average run of respectable American manhood and womanhood, but we all must realize how weak and fallible we are and how utterly unworthy of the magnificent faith he had in us. In the entire course of the generation that I knew him, I never once heard him utter the slightest complaint or criticism concerning any of his friends. On the contrary, he seemed never to tire of praising their virtues and achievements, and the only occasions upon which his calm nature was ever excited occurred when he felt called upon to defend some friend or group of friends from what he believed to be an unjust attack or an arrant want of appreciation.

Such apparent absence of critical power was not a moral defect. It may have been naïve, but it was most spontaneous and genuine. An overwhelming love simply obscured everything else for him. And this amiable weakness was never accompanied, as we might expect that it would be, by a corresponding exaggeration of the faults of his opponents and enemies. In fact, as far as he was concerned, Dr. Keyes knew no enemies and never desired to condemn any one. He was always the first to imply that, if we but understood all the facts, we should not think of blaming the culprit whose conduct was under discussion.

But such a magnanimity did not exist because he himself had never been wronged.

[1] Remarks at the memorial exercises, Skidmore College, Saratoga, May 8, 1925.

No man could possibly have attained his prominence without being constantly open to attacks and hisses from the envious. During more than forty years of public life he must needs have been frequently misunderstood, maligned and injured, but he gave little heed to his traducers and slanderers and moved calmly along through life without hatred or resentment.

This inordinate regard for his friends, moreover, can not be regarded as indicative of general intellectual weakness. Certainly in no other respect did he ever display any want of analytical power. His repute as a man of brains and perspicacity was known from coast to coast, and he was held in the highest intellectual esteem. Whenever there was an educational task requiring marked discrimination and insight, his confreres were wont to think almost instinctively of Dr. Keyes as the man to perform it. And in this estimate they were never deceived or betrayed. As evidence we may recall his record as a revered and efficient high-school principal, his conduct of city superintendencies for nearly a score of years, the impression he made during a decade as teacher-trainer and director of teachers' institutes, his national repute as head of a technical college for five years, and finally his culminating service of more than a dozen years as president of this splendid college for women. His achievement here is unique and will remain a monument forever. No other man or woman in this country had the peculiar intellectual gifts necessary to accomplish it. To whatever degree of distinction and service Skidmore College may attain in the years to come, its present standing among the foremost institutions of its kind in this land of ours is due primarily to the vision, intelligence and devotion of Charles Henry Keyes. It will stand as a memorial to him for all time.

We might add to our citation his services as official visitor to the State University of Wisconsin, as treasurer of the National Education Association, and as president of the American Institute of Instruction, but this is neither the time nor the place to indulge in such annals or in the recital of dry facts and dull details, but rather to seek the soberest understanding and appreciation of his character.

It should be our sole aim to elucidate and to laud his singular belief and confidence in his friends and his magnificent blindness to their faults, and to demonstrate that this generous attitude was second nature and implied neither a mental nor a moral failing. In him it marked not ethical or intellectual lacuna, but rather was evidence of the highest type of spiritual excellence. His dominating characteristic may be described by us, who are less altruistic, as innate hypertrophy of the affections, an uncontrollable and exorbitant warmth of heart. Charles Keyes simply overflowed with the milk of human kindness, and that flood swept aside all those dregs and bitternesses which are so common a heritage of humanity. He had a positive genius for friendship.

Indeed the spirit of Charles Henry Keyes was in full harmony with that of the Great Apostle, and the exemplar of his life may well impress us once again with the message:

> If I speak with the tongues of men and of angels, but have not love, I am become as sounding brass or a clanging cymbal. And if I have the gift of prophecy, and know all mysteries and all knowledge, and if I have all faith, so as to remove mountains, but have not love, I am nothing. . . . Love never faileth: but whether there be prophecies, they shall be done away; whether there be tongues, they shall cease; whether there be knowledge, it shall perish. . . . Now abideth faith, hope, love, these three; and the greatest of these is love.

FRANK P. GRAVES
PRESIDENT OF THE UNIVERSITY
OF THE STATE OF NEW YORK
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EDUCATIONAL EVENTS

THE DALTON PLAN IN THE ORIENT

UPON invitation of the Association for the Advancement of Education in China, Miss Helen Parkhurst, principal of the Children's University School, New York City, will sail in June for China to lecture on the Dalton Plan, of which she is the founder. Only two other Americans have been invited by this association, which is a government organization largely supported from funds received through the Boxer Indemnity Fund.

Miss Parkhurst is to address the fourth annual conference of the association at Mukden during the third week in July, to be attended by delegates from all parts of China, including Mongolia and Tibet. She will lecture also at a summer school which will follow the conference. It is probable that Miss Parkhurst's interpreter will be Professor Liao, of Nanking University. Miss Parkhurst will also visit Japan, where there are numerous Dalton schools.

Several hundred schools in China are now operated on the Dalton Plan. Referring to these, W. Tchishin Tao, director of the National Association for the Advancement of Education, wrote in a recent letter to Miss Parkhurst: "Both systematic experiments and spurious trials have been carried on here. In order to avoid mistakes, and to secure successful results, expert guidance is urgently needed. We naturally look to you, as the mother of the plan, for this timely assistance. The association is now collecting data from institutions which have tried the experiment, so that when you come here we shall be able to report the present status of the movement."

Mr. Tao closed his letter to Miss Parkhurst as follows:

> Of all the ties between nations there is one, the educational tie, which is of permanent and ever-increasing significance. It is very encouraging to see that the educators of the world are getting nearer and nearer. The World Conference of Education held in your country, year before last, accomplished a great deal in creating an educational friendship among the nations participating. The present return of the American Indemnity to China will strengthen the bonds between the two sister republics on the Pacific coasts. Your coming to China has the same meaning and significance. Besides giving the experiments in Dalton Plan a right direction, there will be an impetus given to the educational friendship which has always existed and will continue to exist between Americans and Chinese. Friends of your plan join us in assuring you again of our most hearty welcome for your visit to our country.

Because of her trip to China, Miss Parkhurst has had to decline an invitation to lecture in Russia this summer. She will send a personal representative to visit Russian schools.

A STUDY OF ENGINEERING EDUCATION IN EUROPE

W. E. WICKENDEN, director of investigation of the Society for the Promotion of Engineering Education, has recently sent two letters from France and England sketching the progress of his study thus far of engineering education in Europe. This investigation is in connection with the "appraisal and criticism of the work of American engineering schools to which the studies of the cooperating committees of the society are leading." A report of the earlier visits to engineering schools in this country by Director Wickenden and Assistant Director H. P. Hammond has been given in SCHOOL AND SOCIETY.

Beginning in January Mr. Wickenden came into touch with 17 technical institutions in France, five in Belgium and he also made brief visits to Germany and Switzerland. Going to Great Britain he spent a month there, including attendance as a fraternal delegate at the annual meeting in March of the British Association of Technical Institutions.

In a letter printed in the *Journal of Engineering Education*, Mr. Wickenden writes that Dr. Luiggi, a leading figure in Italian engineering circles who visited the United States last fall, has laid out a program for him of investigation in Italy. "In addition to the countries already named, the work will extend to Holland, Austria, Czechoslovakia and probably one of the Scandinavian countries."

Paying tribute to the scholastic excellence, the cultural foundation and the hard work of French engineering educators, Mr. Wickenden says:

> They are proud of their educational record and are not seeking to borrow from the methods of other nations. The Belgians, however, less original

and more adaptive, have sought and are seeking far afield for the models of their technical education, so that an American finds them kindred spirits. The Germans, too, viewing with admiration the vast industrial and material prosperity of America, are inclined to associate them with certain features of our educational system of which they are eager to learn.

. . . France apparently prefers to remain France, a land where individual attainment and development are highly fostered, rather than to give herself over to a modern program of mass organization for mass production.

The most striking feature of British technical education, Mr. Wickenden found, "is its great flexibility. Provision is made for men of almost every type and every grade of ability and preparation."

Engineering education in British universities is an expensive business. The equipment is large in proportion to the number of students. The same is true of the teaching staff. The teachers are well paid. As they receive in actual currency the practical equivalent of American teachers, their relative compensation is considerably greater. British universities are taxed on their property values. The money outlay per student is considerably above the American average. It is to the credit of the British educators that they have not yielded to the temptation to expansion as a means of reducing unit costs.

University teachers in Britain are teachers by career. The supplementary earnings from engineering practice are quite small and come only to a few outstanding men. There are few opportunities for remunerative employment in vacation periods. For contact with industry and advances in practice the chief reliance is placed on research and on active service on the committees and commissions of the national institutions of engineers. Teaching loads are practically identical with those in the stronger American schools. Turnover among teaching forces is small and advancement comes slowly.

GROUP INSURANCE AT TEACHERS COLLEGE

TEACHERS COLLEGE, Columbia University, has just established a million-dollar group insurance program, providing protection for more than six hundred members of the faculty and clerical force.

Following the approval of a tentative plan by the board of trustees recently, the proposal was submitted to eligible teachers and clerks. Their response was so favorable that a contract with the Metropolitan Life Insurance Company was signed immediately by Dean James E. Russell.

Not only have more than the legally required number of employees subscribed to the plan, but a resolution expressing their appreciation and gratitude for the action of the board was adopted by them.

The plan is cooperative, with the college and the insured individuals paying the premiums. It is comprehensive, and includes life insurance, accidental death and dismemberment protection, and health and accident insurance carrying benefits ranging from $10 to $35 a week. The life insurance and accidental death and dismemberment insurance each totals approximately $1,000,000.

The group plan provides a schedule of insurance dividing employees into six salary classifications, with the amount of insurance an individual may carry being governed accordingly, and ranging from $1,000 to $5,000 for life insurance, and covering the same scale for accidental death and dismemberment protection.

Any subscribing employee, whose salary is under $1,500 a year, comes under Class VI, and is entitled to $1,000 life insurance, a similar amount of accidental death and dismemberment protection, a $10 weekly benefit in case of sickness and non-occupational accident, and payments of $51.04 a month, for 20 months, should he become totally and permanently disabled before age 60.

The benefits under the other classifications are proportionately the same, up to Class I, which carries $5,000 life insurance, $5,000 accidental death and dismemberment protection, a $35 a week sick benefit and provision for total and permanent disability payments of $90 a month for 60 months.

Supplementing the actual contract, the plan includes a free visiting nurse service. In the event of sickness or injury, an insured employee has the right to summon a trained nurse who, without charge to him, will help add to his comfort and assist in his recovery.

PLANS FOR WOODROW WILSON COLLEGE

TWO hundred residents of Georgia met recently at Atlanta to formulate plans for erecting a memorial college to Woodrow Wilson in

Georgia. Pleasant A. Stovall, publisher of the Savannah *Press*, and minister to Switzerland under the Wilson administration, is at the head of the movement.

Plans for the college were outlined at the Atlanta meeting, and it was announced that the city of Valdosta, which has been selected as the location of the college, has raised $500,000 toward the project. The financial campaign will now be carried on throughout the state and later throughout the nation. The national convention of the American Legion has pledged support of its eleven thousand posts and the American Federation of Labor has offered to erect one of the first buildings, to be known as Gompers Hall.

President Mezes, of the College of the City of New York, heads a committee of executives who will determine the educational policy of the college along the lines approved by Woodrow Wilson. It will specialize in the humanities, history, government, politics and other subjects in which President Wilson was interested. It is planned to take only three hundred men, selected by competitive examinations from all parts of the country. Instruction will be by the tutoring system. The plans for the establishment of the college are at present under a temporary board of trustees, but it was announced that a permanent board will soon be constituted which will include nationally known and representative statesmen, educators and men of affairs.

AN EDUCATIONAL CAMPAIGN IN VIRGINIA

"A GREATER Virginia through education" is the slogan of a campaign now in progress throughout the state of Virginia. Meetings are being held and newspapers are publishing data to bring to the people of Virginia the idea of "public education as one of the largest and most fundamental undertakings of the state."

The official statement regarding the present campaign declares:

> Its objects are to interpret to the citizens of Virginia the educational development and needs of the commonwealth; to promote the fundamental considerations necessary for the future progress of the state; to secure the reasonable consolidation of schools, equal educational opportunity for all children, longer school terms, full and regular attendance and a more adequate corps of teachers with commensurate compensation.

The committee in charge of the campaign, noting the changes of the past fifteen years, shows that since 1910 the school enrollment has increased 40 per cent., attendance 60 per cent.; the school term has been lengthened from 140 to 160 days; school property has increased from a value of $8,500,000 to $44,500,000. Vocational education has been introduced with an expenditure of $70,000 in 1919, raised to $350,000 by 1924. The number of school teachers has increased 60 per cent. and the professional qualifications of teachers have been raised markedly. High schools have increased from less than 100 to 372.

The Virginia State Board of Education is urging a material increase in the funds to support the elementary schools, an increase in the high school fund, and a fund for equalization of school opportunities as between the different counties of the state. Each of these recommendations is being treated in the campaign literature.

A SCHOOL FOR MUSEUM WORKERS

PLANS for a school for museum workers, to open at Newark, N. J., in October, 1925, have been announced by J. C. Dana, director of the Newark Museum and Newark Public Library. The first class will be limited to twelve students, and will continue for one year.

The course will include, according to Mr. Dana's announcement, "formal teaching, class instruction, and lectures and instruction in technical matters by members of the staffs of the library and the museum." The work will cover: Purposes of museums and libraries; present methods of accomplishing these purposes; the elements of such library work as lead naturally to the elements of museum work; management of books, classifying, cataloging and preparation for the shelves; a museum's adaptation to its community; making and preparing for use a collection of pictures supplementing a collection of objects; gathering and handling a collection of fine prints; preparation and installation of objects of all kinds; museum cases; labels for objects; posters, circulars and

miscellaneous printing—including the writing of the same and the printing thereof; experience in the museum's print shop; preparation of objects for lending; a lending collection and its relation to the schools of the city; a children's museum and its relation to the schools of the city.

Of the purpose of the school the announcement speaks as follows:

> The school will not attempt to equip its students in expertness in any field of art or science. Its purpose is to prepare persons to be fairly helpful in that part of a museum's activities which may properly be called management. Both museum and library are so confident that the school can discover and develop aptitudes in its students and can train them well in such elements as accuracy, intensity, speed, team-work and agreeable attitude toward the persons who use museums and libraries, that the two institutions purpose to take as members of their staffs several of the twelve students at the end of the nine months of work and study.
>
> The course is to be practical in the extreme, having to do with present-day problems of museum development. The students will not be expected during the year of study to attempt to equip themselves for expertness in science, art or industry. Rather, they will equip themselves for actual practice in making the contents of a museum interesting and, above all, helpful to the community that supports it.

A NEW FEDERAL EDUCATION BILL

FOLLOWING a meeting of members of the Legislative Commission of the National Education Association at Washington in March, a new Federal Education Bill, embodying that part of the association's program which has to do with the creation of a Federal Department of Education, but omitting the financial aid provisions, has been drafted. The bill will be submitted in July to the Indianapolis meeting of the National Education Association, and to other educational and lay groups interested in the creation of a Department of Education. The following is an outline of the new bill by sections:

Section 1. Creates a department of education with a secretary in the president's cabinet.

Section 2. Authorizes an assistant secretary of education.

Section 3. Provides for the coordination of existing educational work of the federal government in the new department, including the Bureau of Education, the Federal Board for Vocational Education, Howard University, and the Columbian Institution for the Deaf.

Section 4. Defines powers and duties of the secretary of education.

Section 5. Provides for inter-departmental conferences on education.

Section 6. Provides for enriched research activity.

Section 7. Provides for appointment of personnel.

Section 8. Authorizes appropriations to run the department.

Section 9. Provides for national conferences on education.

Section 10. Requires the secretary to make an annual report to the congress.

Section 11. Enacting clause.

Dr. George D. Strayer, chairman of the Legislative Commission, comments as follows on the new proposal in the May issue of the *Journal* of the National Education Association:

> In the new bill, as drafted, emphasis is placed upon the function of the department of education as an agency to conduct investigations and to disseminate information. We feel that this is in accord with the position of the president as expressed in his address before the National Education Association at its meeting last July.
>
> Those who have been supporting the National Education Association program providing for a federal department of education and for further federal support for the public school system are still convinced of the legitimacy of this program. In the present situation, however, it seems wise to bring all of our strength to bear in support of a bill creating a department of education. We already have assurances that this bill will have the support of many educators who favor the creation of a department of education, but who were not willing to support the bill carrying large appropriations.

EDUCATIONAL NOTES AND NEWS

DR. WILLARD D. JOHNSON, supervisor of training classes for the New York State Department of Education, will retire on May 15, after nearly fifty years in public school work for the state. Widespread appreciation of his long and efficient service was attested to by the tribute paid at the December meeting of the Associated

Academic Principals. His present and former associates in the department tendered him a farewell party on April 30, when a book of friendly messages testifying to the affection and esteem with which he is held was presented to him. Tributes were paid him in addresses by Assistant Commissioner George M. Wiley and Dr. Avery W. Skinner, director of the examinations and inspections division of the department.

EDWARD P. SHERBURNE, of Portsmouth, N. H., principal-emeritus of the Jefferson School, Jamaica Plain, was the guest of his former pupils and teachers at a banquet in the school hall on May 5. The occasion was Mr. Sherburne's eighty-first birthday.

MISS SARAH COGGIN, a first grade teacher of P. S. 12, Brooklyn, N. Y., was the guest of honor on May 5 at a party in celebration of her fiftieth year in the service of the schools. Miss Coggin's entire half century of teaching has been in the same school and in the same grade.

ON May 12 Patrick H. McQuade, principal of School 21, Albany, will have completed 60 years as a member of the teaching staff of the Albany public schools. A testimonial dinner in honor of the man and his service is planned by the teachers of Albany. The New York State College for Teachers conferred on him the honorary degree of master of arts last June.

A NUMBER of other teachers with long terms of service in the public schools of New York State will retire at the end of the present school year. Among these are the following: Margaret McCarthy, a teacher for 44 years in the Academy Street School of Watertown, and for 2 years prior a rural school teacher; Margaret Ryan, for 37 years a teacher in the Poughkeepsie schools; Mrs. J. C. Lee, for 35 years a teacher, during the past year being at Ardonia; and three Dunkirk teachers: Belle Thompson, who has taught since 1882; Lucy Zizell, who has taught since 1883; Kate C. Foley, who has taught since 1884.

AT the recent inauguration of Benjamin J. Burris, state superintendent of Indiana, as president of the State Teachers College at Muncie, the principal speaker was Henry H. Shepard, Mr. Burris's successor as state superintendent. Other speakers included Dr. Edward C. Elliott, president of Purdue University; Dr. William L. Bryan, president of the Indiana State University; Dr. L. N. Hines, president of the State Teachers College at Terre Haute, and Dr. W. W. Parsons, president-emeritus of Terre Haute Teachers College.

THE HONORABLE ELIHU ROOT has resigned from the presidency of the Carnegie Endowment for International Peace. He is succeeded by Dr. Nicholas Murray Butler, president of Columbia University.

ARTHUR S. SOMERS has been reappointed by Mayor Hylan a member of the New York City Board of Education. In making the reappointment Mayor Hylan wrote: "Though Mr. Somers has not always agreed with me, I felt that his long and splendid record as a member of the Board of Education entitled him to reappointment. His faithful work in helping to keep our school budget on a sound business basis and within reasonable proportions is deserving of particular praise."

PRESIDENT COOLIDGE has appointed Commissioner of Education Frank P. Graves a member of the board of visitors of the United States Naval Academy at Annapolis.

SUPERINTENDENT FRANK CODY, of Detroit, will be one of the United States representatives at the conference of the World Federation of Education Associations, to be held in Edinburgh, Scotland, July 20 to 28.

WELLS A. HALL, who has been for twenty years superintendent of the schools of Concord, Mass., has been reappointed for another year.

JULIUS E. WARREN, for the past four years superintendent of schools at Gloversville, N. Y., has been appointed superintendent of schools in Springfield, Mass.

IT is stated in the *School Board Journal* that, owing to the policy of economy adopted by New Bedford, Mass., Superintendent Allen P. Keith will not recommend Assistant Superintendent Clarence E. Howell for reappointment. Mr. Howell came to New Bedford from Lincoln, Nebraska, where he had served as assistant superintendent. He came to New Bedford in 1922 and served under True C. Morrill, then superintendent, and later under Allen P. Keith, receiving a salary of $5,000 a year.

MISS CAROLINE J. PORTER, of Teachers College, Columbia University, secretary of the students' bureau of the Institute of International Education, has been appointed dean of women of Hampton Institute, to succeed Miss Louise Young, resigned.

MISS EDITH L. BUSH, assistant professor of mathematics at Tufts College, has been nominated as dean of Jackson College by a special committee of the trustees. She will succeed Dean Caroline S. Davies, who retires in June.

MISS EMMA MARSHALL DENKINGER, associate professor of English at Wellesley College, has been elected dean of Wheaton College.

DR. GEORGE A. COE, professor of religious education in Teachers College, Columbia University, will give a report at the annual luncheon on May 23 of the New York Teachers' Union, presenting material of the union's committee on moral education.

PRESIDENTS of women's colleges, including President William Allan Neilson and Dean Frances Fenton Bernard, of Smith; Henry N. MacCracken, Vassar; Ellen F. Pendleton, Wellesley; Marion E. Park, Bryn Mawr, and Mary E. Woolley, Mount Holyoke, held on May 8 a conference on problems of school administration at Northampton, Mass.

AT the recent annual meeting at Washington of the American Council of Education, the Right Rev. Edward A. Pace, director of studies at Catholic University, was chosen *president;* Raymond M. Hughes, president of Miami University, *secretary,* and Corcoran Thom, prominent banker, *treasurer.* Dr. William Mather Lewis, president of George Washington University, and Professor Charles H. Judd, of the University of Chicago, were appointed members of the executive committee. The council approved a budget of $192,000 for carrying on its activities during the coming year. Speakers at the final session were Miss Virginia Newcomb, Harry Pratt Judson, William F. Russell, Virginia C. Gildersleeve and Henry Allen Moe.

THERE was an attendance of 4,500 at the recent sessions of the fifth annual Ohio State Educational Conference. The speakers included President Livingston Farrand, of Cornell University; Professor F. W. Johnson, of Columbia University; Superintendent William McAndrew, of the Chicago public schools; Superintendent C. W. Washburne, of Winnetka, Ill.; Glenn Frank, editor of the *Century Magazine,* and Dr. Henry H. Goddard, of the Ohio State University.

AT the National Conference of Deans and Advisers of Men, held recently at Chapel Hill, N. C., C. R. Melcher, dean of the University of Kentucky, was chosen president, and the University of Minnesota was selected as the next meeting place.

The central division of the Illinois state teachers' association elected the following officers: *President,* M. J. Holmes, Normal; *vice-president,* Ada P. Foster, Fairbury; *secretary,* Maud Blue, Clinton; *treasurer,* H. B. Beecher, *Peoria.*

ROBERT MORSS LOVETT, professor of English literature, University of Chicago, heads the list of officers and directors of the League of Industrial Democracy recently elected. Among the vice-presidents are Vladimir Karapetoff, professor of electrical engineering, Cornell University, and Vida D. Scudder, professor of English literature, Wellesley College.

PROFESSOR EDWARD H. REISNER, of Teachers College, Columbia University, will give a course of lectures on the history of American education at the Teachers College of Kansas City, Missouri, during the week of June 8. The week following he will give a similar series at the Northern Arizona Normal School, Flagstaff, Arizona.

THE Western Division of the American Philosophical Association, at its Easter meeting held at the University of Illinois, expressed its appreciation of the work and worth of Professor James E. Creighton, of Cornell University, as a philosopher by devoting the morning session to a consideration of his teachings. The speakers were Professor Frank Thilly, of Cornell University; Professor George H. Sabine, of the Ohio State University, and Professor Glenn R. Morrow, of the University of Missouri. The discussion which followed paid a high tribute to Professor Creighton's achievements as a thinker, as an editor, as a dean, as a teacher and as a man.

A MARION LEROY BURTON Memorial Fund has been established at the University of Michigan by the provision of a fund of $100,000 by a group of business men, including Henry Ford, of Detroit, and Stanley D. McGraw, C. F. Kelley, W. A. Starett, Earl Babst and James Baird, of New York City. The principal is to remain as a memorial to the late president of the university, and the first beneficiary will be his widow. During her life time she will receive the income on the investment, and should her death occur before her children are thirty years of age, they will receive the income until attaining that age. After the payment to Dr. Burton's dependents ceases, the income is to be used "for such emergency purposes, not properly met by tax funds, as the Board of Regents may determine."

E. MORRIS COX, assistant superintendent of schools of Oakland, and one of the foremost educators of California, died on March 17. A memorial service for Mr. Cox was held in the auditorium of the Roosevelt High School, Oakland, which was attended by the entire educational staff of Oakland, as well as representatives of the state and county, and educators of the Eastbay section who had known Mr. Cox during his ten years' leadership of the state teachers' association.

DAVID WILLIAMS, a former superintendent at Redding, Ia., died at Omaha, Nebr., on March 15 at the age of sixty-nine years. Mr. Williams was prominent in educational circles of Iowa for many years and held various superintendencies in the state.

SAMUEL VALENTINE COLE, president of Wheaton College, Massachusetts, died on May 6. President Cole became head of Wheaton Seminary in 1897, five years before it became Wheaton College.

CHARLES FOSTER KENT, professor of Semitic languages and biblical literature at Yale University, died on May 3, aged fifty-seven years.

DR. WILLIAM C. MCCLELLAND, professor emeritus of English and literature at Washington and Jefferson College, died on May 7, as the result of an automobile accident, aged seventy-three years.

DR. LOUIS BEVIER, professor of Greek literature and language at Rutgers University, died on May 5, aged sixty-eight years.

JOHN D. ROCKEFELLER, JR., has given $625,000 toward the fund for Near East Colleges, which is seeking to raise $2,500,000 to defray the expenses of the five American institutions of the Near East in the next five years. "Mr. Rockefeller's gift is conditional," Mr. Dodge said, "on the entire amount being subscribed by June 30, 1925." The fund to date, including the Rockefeller gift, is $1,630,000, leaving $870,000 to be obtained in the next six weeks. Mr. Dodge said the colleges were facing a serious financial crisis and that it was necessary that friends of these institutions meet the emergency and raise the remainder of the fund within the allotted time or a serious curtailment of the work would be necessary. One thousand small gifts have thus far been received from thirty-eight states. The five institutions for which the fund is being raised are Robert College, the Constantinople Woman's College, the American University of Beirut, the International College of Smyrna and the Sofia American Schools. Mr. Dodge said that the colleges had given over fifty years of service in the Near East and that they were responsible for many of the changes that had taken place in that time.

THE Laura Spelman Rockefeller Memorial has contributed $250,000 to be used over a period of five years to aid in the equipment and maintenance of an Institute of Child Welfare at the University of Minnesota. The institute is to carry on studies under the direction of specialists in the various departments such as psychology, education, pediatries, physiology, home economcis and sociology at the university. It is also to serve as a training school for nursery school teachers and for leaders in parent education. Furthermore, it is to carry out a program of extension service throughout the state in the education of parents in the problems of child training.

THE residue of the estate of Henry S. Fox, Jr., a prominent Houston banker, valued at more than $1,000,000, is bequeathed to the Rice Institution, Houston, to be used either for dormitories or a new gymnasium.

THE Missouri Legislature has appropriated

$3,083,203.02 for the university for the biennial period. This amount was included in the educational bill passed on April 3 by the senate exactly as it came from the house. Senator Nick T. Cave, chairman of the Senate Appropriation Committee, stated that the educational bill was offered without revision on recommendation of Governor Baker, who promised to call the heads of the various state schools into conference before passing on the measure and would ask their advice if the appropriations were reduced. This is a precaution against careless reductions. It will be remembered that the budget which was presented by President Stratton D. Brooks requested a total of $6,626,864.68. The senate on April 4 passed the building bill which provides $275,000 for a new Dairy Building and $200,000 to purchase a site for an auditorium. The building bill is separate from the educational appropriation bill.

J. T. SCOPES, charged with violating the newly enacted Tennessee law against teaching evolution in the schools of the state, on May 9, was held for action by the Rhea County grand jury by three justices of peace who conducted a preliminary hearing of the charges. Bond was fixed at $1,000, but the state expressed a willingness to accept the recognizance of the defendant and the court acquiesced. The defense was built up on a theory that the law enacted by the recent legislature was unconstitutional. To this, however, Justice Benson, speaking for his two colleagues, Justices Green and Wilbur, said: "We feel that it is not within our rights to pass on the constitutionality or the wisdom of the law. The defendant is at least technically, if not intentionally, guilty; hence our decision to hold him for action by the grand jury." The act Mr. Scopes was charged with violating was passed at the last session of the Tennessee Legislature and became effective on March 21. The preamble to the act designates it as an act "prohibiting the teaching of the evolution theory in all universities, normal schools and all other public schools supported in whole or in part by public school funds of the state." The act continues that it shall be a misdemeanor punishable by a fine of from $100 to $500 "to teach any 'heory that denies the story of the divine creation of man as taught in the Bible and to teach instead that man is descended from the lower order of animals."

TEACHING evolution in the schools of Florida would be unlawful under provisions of a bill introduced in the house on May 6. Under the proposed legislation, teaching of the theory of evolution would not be permitted in any university, normal school or public school, supported in whole or in part by state funds. Any teacher found guilty of violating the provisions of the act would be disqualified to teach in the schools of Florida.

GOVERNOR JACKSON has vetoed the bill passed by the recent session of the Indiana legislature which would have permitted public school authorities to release public school children from attendance at the schools for two hours a week for the purpose of receiving religious instruction. The governor's action was taken after he had received from the attorney general of Indiana an opinion to the effect that the bill violated several provisions of the Indiana constitution. The bill was the third of an almost identical character which had been advocated during the recent session. Two others were killed in the legislature itself by indefinite postponement.

GOVERNOR DONAHEY, of Ohio, on April 29, vetoed the Buchanan bill passed by the recent session of the Ohio General Assembly, to make daily reading of the Bible in all public schools of Ohio compulsory, on the ground that "it opposes the principles of civil and religious liberty which have made our government the model of the world."

IMPORTANT educational measures passed by the Pennsylvania Legislature and signed by Governor Pinchot include one providing a new high school classification that will include junior and six-year high schools and another requiring school boards to open evening classes in English, citizenship and other curricular subjects for immigrants, illiterates and adults, upon the written application of twenty residents sixteen years of age and over.

A PROPOSED by-law is now before the New York City Board of Education which would bar school fraternity members from holding positions of honor in the schools and from rep-

resenting the school on any team. It would also provide that the principal may exact a pledge from any student representing the school on a team or honor society not to join a fraternity. If after taking such a pledge a student is found to have joined a secret society the principal would be empowered to withhold his diploma. Members of school fraternities are presenting protests to the board against the proposed action.

THE Paterson, N. J., Board of Education has reestablished the coeducational system in the high schools which was set aside for the segregation plan in 1923.

BEATRICE ENSOR and Isabel King, now attached to the coeducational school of St. Christopher at Letchworth, England, have resigned in order to start a new school in the fall which will be a special demonstration school for the New Education Fellowship. The site for the new school has not yet been selected, but it is to be an estate "preferably in Hampshire, Kent, Sussex or Surrey," so located that outdoor opportunities will be easy. The plan contemplates a central school and eventually a number of bungalows around it, each taking not more than ten or twelve children.

THE New York *Evening Post* reports that the little town of Holland, Mo., is split wide open as the result of the flag being presented to the school by the Ku Klux Klan. H. O'Connor, superintendent of schools, and James F. Cahoon, justice of the peace and president of the school board, are arrested, accused of disrespect for the flag. They refuse to permit the flag to remain in the school building, contending it was presented by an un-American organization. Children of the opposing factions are making strike threats.

MAJOR questions of national governmental policy which were favored by the National League of Women Voters at the Richmond meeting recently included the child labor amendment, creation of a board of public welfare in the District of Columbia, establishment of a Federal Department of Education, with adequate financing, and of public schools in the District of Columbia, federal aid to states under the public school system for the removal of illiteracy, Americanization of foreign born, promotion of physical education, training of teachers and equalization of educational opportunity and support of legislation giving enlarged appropriations to the Bureau of Home Economics for research work.

DONATIONS to the University of Chicago, the University of Illinois and Northwestern University during the last twelve months total $20,000,000, of which Northwestern University has received $8,000,000, most of it for the expansion of its downtown campus. The chief givers were: Mrs. Montgomery Ward, $4,000,000; Milton H. Wilson, $600,000; Mrs. Levi Mayer, $500,000; Mrs. Ellen M. Thorne, $250,000 and the Wieboldt Foundation, $500,000. The University of Illinois receives comparatively few private gifts. The State of Illinois has appropriated a biennial budget of $10,732,000, making this year's available fund about $5,366,000. Contributions from outside sources include $5,000 from the Illinois State Electrical Association; $25,000 from six Chicago public utilities; $5,000 from seven down-state companies and $100,000 from Boetius H. Sullivan for a Roger C. Sullivan memorial radio station.

MORE than $3,000,000 has been contributed toward the erection of the University of Pittsburgh's proposed 52-story cathedral of learning.

HAROLD S. VANDERBILT has given $125,000 for a gymnasium to be built in connection with the dormitory for the students of the Harvard Medical School, the fund for which has reached a total of $743,000, leaving $480,865 to be collected. In addition to this gift Mr. Vanderbilt will provide an annual contribution for five years after the completion of the gymnasium to cover the services of a capable instructor.

THE Lima Board of Education has asked the Bureau of Educational Research to make a complete building survey in order to determine a school building program for the next ten years. Lima has been growing rapidly and the school population has increased to such an extent that additional classrooms and buildings are needed. The survey will be under the direction of P. R. Stevenson. Mr. R. E. Offenhauer, superintendent of schools, and Glen S. Long, director of research, are helping in planning the survey.

THE Hampton Tuskegee Endowment Campaign has reached four million, one hundred thousand dollars and of this amount one hundred and fifty thousand dollars has been subscribed by the colored people of the United States who, though they constitute only 10 per cent. of the population and one per cent. of the wealth of the nation, have given 5 per cent. of this campaign fund, according to announcement made at the closing of the program of the fifty-seventh anniversary of Hampton Institute, April 25.

D. JOHNSTONE SMITH, a former vice-chairman of the Glasgow Chamber of Commerce, has given £20,000 to Glasgow University for the foundation of a chair in accounting.

The Christian Science Monitor reports the granting of a charter for the establishment at Miami, Florida, of the University of Miami, to contain colleges of fine arts, agriculture, mechanical and industrial arts, natural science and classical departments and a normal department for the training of teachers. In so far as practicable it is the ambition of the founders of the university that it shall be an out-of-doors institution, utilizing the advantages of the climate of Florida. It is said that the aim is an endowment fund of $10,000,000 and physical properties to cost $1,000,000. Twenty buildings are contemplated, grouped in schools or colleges and all of open-air construction. Facilities will be provided to protect them from rains and storms by means of adjustable roofs and sides. Officers of the university are given as follows: Judge William E. Walsh, *president;* Ruth Bryan Owen, *vice-president,* and Frederic Zeigen, *secretary and treasurer.* The regents are: Mr. Zeigen as managing regent, William E. Walsh, William Jennings Bryan, Clayton Sedgwick Cooper, E. G. Sewell, B. B. Tatum, James M. Cox, Mrs. Owen, Frank B. Shutts, George E. Merrick, Thomas Pancoast, Mitchell D. Price, Bertha M. Foster, Henry Salem Hubbell and Leslie D. Robertson.

CORRESPONDENCE

AN INDIGENOUS SCHOOL WEEK

THE sixth annual celebration of California Public Schools Week, which occurred early in May this year, serves to remind us that the National American Education Week is a Western child. When Dr. P. P. Claxton, then national Commissioner of Education, visited California five years ago, he was so impressed by the statewide activities in connection with Public Schools Week, that he made it a national institution.

Since that time California has twice yearly, in the spring and in the fall, given special attention to the "interpretation of the American public schools" to the American public. The spring-time observance of Public Schools Week is conducted under the general auspices of the Masonic fraternity, although the meetings are public and community-wide in their scope and appeal.

In his proclamation, Grand Master David J. Reese states that the primary objective of the observance this year will be to "inform the public in general, and the parents of school children in particular, of the real condition of our public schools, with special reference to certain matters that have been the subject of discussion and criticism, such as the curricula, methods of instruction and the cost of education."

Prominent laymen, clubwomen and school people throughout the state will make addresses at the numerous meetings which are being planned in many communities. A beautiful little play, "The Crucial Hour," especially prepared for these meetings, will be presented in many places by local school children. The play, in "Peter Pan" style, and with imps and fairies, depicts the necessity for supporting and defending the public schools.

A thirty-page bulletin for speakers, concisely presenting the essential facts of modern education, has been prepared by the State Committee, and is being widely used. The sixth celebration gives every promise of being even larger and better than its five notable predecessors, and betokens the abiding interest of the American people in their schools.

VAUGHAN MACCAUGHEY
BERKELEY, CALIFORNIA

THE UNIVERSITY OF NORTH CAROLINA AND PROFESSOR KOEHLER

IN view of the widespread publicity that has been given through the press to the statement that the University of North Carolina had cancelled an invitation extended to Professor Koehler, of the University of Berlin, exchange professor at Clark University, to lecture at the

University of North Carolina, the executive committee of the university chapter of the Society of Sigma Xi desires to make the following statement:

First. A lecturer chosen from some one of the sciences is annually selected by the executive committee of the society. Among names presented to the committee this year for its consideration was that of Professor Koehler. This name was given only incidental consideration, as the policy of the society, to have represented the main fields of science in rotation, had already brought it to the decision that this year the lectureship should be filled from the fields of the medical sciences.

Second. Professor Koehler, therefore, was not the choice of the committee, nor even seriously considered by it. No communication of any sort passed between the committee and Professor Koehler or any one at Clark University. The statement that an invitation had been extended to him is therefore altogether without foundation. Neither from the committee nor the university authorities has any invitation or communication gone to him at any time.

The committee feels that it should make this statement in justice to the local society of Sigma Xi, the University of North Carolina and Professor Koehler.

JAMES M. BELL,
ROBERT E. COKER,
THORNDIKE SAVILLE,
WM. DEB. MACNIDER

QUOTATIONS

DEAN INGE ON SCIENCE AND RELIGION

THE Tennessee Legislature and Mr. Bryan must see a new menace to the country, to religion and to their own political future in Dean Inge, of St. Paul's. For the dean has had the effrontery to say that religion and science are not natural enemies. He has even abused our institutions of free speech by declaring that: "Personally, I do not believe Darwin's theory of evolution presents any formidable problem to the church." Nor did he stop there. He told of passing several hours in our Museum of Natural History and "feeling a sense of gratitude for the new revelation which men of science are contributing."

Reconciliation of religion and science means that theologians would be listened to on theology and scientists on science. Mr. Bryan is neither a theologian nor a scientist and would be left out in the cold. Just as Mr. Bryan thought it necessary to keep open the breach in the Democratic party by advising the Democrats of the west and south to ignore the east, so he thinks it necessary to keep up a constant warfare between science and religion.

It is a significant fact that recently the bitterest attacks on science have not come from officials of the church, but from self-appointed political defenders like the Commoner and the Tennessee Legislature. "If we believe in the invincibility of the Gospel," says Dean Inge, "if we have faith that the church has power to stand on its own feet, we should be less timid in accepting the results of secular knowledge."

That is what faith means. It is no service to religion, but a grave disservice, to preach in an increasingly scientific age that the triumph of science must mean the defeat of religion. The true defenders of religion have confidence that ultimately the more mankind understands of the secrets of nature the deeper will be its reverence for the creator of nature.—New York *Sun*.

THE PERILS OF TEACHING EVOLUTION IN TENNESSEE

IF a Dayton, Tenn., despatch to the Nashville, Tenn., *Banner* may be relied upon—and the Associated Press circulates it in these parts—then the science teacher in the Dayton High School has been arrested under the new state law for teaching the theory of evolution. Let us reconstruct the scene:

Mr. Scopes (the science teacher)—Now, boys and girls, the nineteenth century produced in England a man named Charles Darwin. After exhaustive experiments, in which he found interesting similarity and progression in the forms of animal life as they advanced from the amœba to the monkey, he wrote a book on what he called the theory of evolution. Darwin, noting many physical likenesses between the monkey and man, as between the amœba and the monkey, but unable to discover the precise animal link between the monkey and man, said it was entertainable that there was a direct historical, anatomical progression from the amœba to man. In that sense, man, he thought, might be descended from the lower animal forms, and directly from the monkey. Darwin wasn't sure of

this: his book ends on a note of great doubt. But pure science largely credits his theory, though the missing link hasn't been found yet.

George W. Rappleya (Dayton business man)—Constable, arrest that man for violating the law of the sovereign State of Tennessee.

Constable—Professor, you are under arrest and liable to a fine and imprisonment.

It all seems ridiculous enough. And it would be if it were not so serious. But the despatch suggests that the arrest is a deliberate attempt to discover whether such a law can stand in the courts. If it shall develop that Tennessee nor any other state has the right to seek to impose a penalty on knowledge, Mr. Scopes, of the Dayton High School, will take rank as a protagonist of progress.—The New York *World*.

SOCIETIES AND MEETINGS

THE COLLEGE ENTRANCE EXAMINATION BOARD AND PSYCHOLOGICAL EXAMINATIONS

THE College Entrance Examination Board, at its spring meeting in New York on April 4, voted unanimously to conduct psychological examinations in June and in September, 1926, and authorized an expenditure up to $15,000 "for the preparation, the supervision, the scoring and the reporting" of the new examinations. The board will hold these examinations "under the direction of a technical committee of five specialists who have worked on psychological examinations and who represent colleges belonging to the board."

A brief sketch of the board's interest in psychological tests in the past several years was given by Professor R. N. Corwin, of Yale, chairman of the committee of review, in introducing the resolution prepared jointly by the committee of review and the executive committee of the board. This interest found expression in the activity of a commission on psychological tests which reported at the annual meeting last November. The board at that time authorized its committees "to go forward with the preparation of psychological tests, to consult psychologists and, if possible, to suggest a definite plan at the April meeting."

The members of the advisory committee of psychologists appointed were Professor Carl C. Brigham, of Princeton University; Dr. Robert M. Yerkes, of the National Research Council, and Professor Henry T. Moore, of Dartmouth College.

Professor Corwin reported meetings of the executive committee, the committee of review and the advisory committee of psychologists on February 27 and on April 3. After consideration of various plans the committees had come, he said, to the conclusion that the board should handle the psychological examinations without the help of established outside agencies but under the direction of a group of psychologists "from colleges belonging to the board."

Professor Corwin pointed out that the new procedure will do away with the usual committee of examiners and committee of revision; all findings of the committee on preparation of the psychological papers will be reviewed by a directing committee of five psychologists. The directing committee is to "appoint one or more specialists, probably not of their own number, who could give the time necessary for the preparation of the papers." The directing committee is also to select an expert to take charge of the scoring. Professor Brigham, of Princeton, chairman of the directing committee, was present at the board meeting.

Upon the passing of the two resolutions offered by Professor Corwin providing for psychological examinations, Dr. Thomas S. Fiske, secretary of the board, presented the executive committee's resolution by which the secretary is authorized "to expend $15,000, or so much thereof as may be necessary, for the preparation, the supervision, the scoring and the reporting of psychological examinations to be held in 1926." Dr. Fiske explained that "the estimate is that $5,000 will be needed for preparing the papers, $5,000 for scoring the results and $5,000 for collecting material of an experimental character to perpetuate the examinations." The $15,000 appropriation was unanimously voted.

INCREASE IN EXAMINATION FEE

The question of expense for the psychological examinations led to a discussion of the whole question of fees and the adoption of a new by-law raising the examination fee for all candidates in 1926, irrespective of the number of examinations taken, to $10, an increase of $1 over this year and last. Dr. Fiske declared that, because of the decreased purchasing power of the dollar, a $10 fee was about equivalent to the

$6 fee of earlier years of the board. In response to a question of Dean Howes, of Williams College, Dr. Fiske replied that it was not regarded as practicable to have a separate fee for the psychological examination if taken alone, as this would bring up the same point in regard to single content-examinations.

The new by-law, passed unanimously by the board and accordingly effective in 1926, provides that the examination fee for all candidates shall be $10 if applications and fees are received by the secretary in accordance with the following schedule:

> For centers in the United States east of or on the Mississippi, three weeks before the first day of the examinations; for other centers in the United States or in Canada, four weeks before the first day of the examinations; and for all other centers six weeks before the first day of the examinations.
>
> Applications and fees received later than this schedule demands may be accepted, at the convenience of the secretary, only when accompanied in each instance by an additional fee of five dollars.
>
> The fee of a candidate whose application has been accepted may be refunded only if the request for the cancellation of the application and the return of the fee reach the secretary at least one week in advance of the first day of the examinations.

Dr. Fiske pointed out that the new by-law reduces the rate for students taking examinations in foreign countries and reduces also the increased rate for late application, which formerly was double the regular charge.

SCHEDULE FOR 1926

The examination schedule for 1926 had been the subject of much consideration, said President Pendleton, of Wellesley, reporting as chairman of the committee on examination schedule. The schedule, as approved by the board for 1926, will be as follows:

> Monday a. m., algebra; p. m. French. Tuesday a. m., English; p. m. history. Wednesday a. m., psychological examination; p. m. geometry. Thursday a. m., Latin; p. m., physics, biology, zoology. Friday a. m., chemistry, botany and physical geography; p. m., German, Greek, Italian and Spanish. Saturday a. m., Latin 5 (poets), Latin Q (sight translation of poetry), free hand drawing, mechanical drawing.

The committee was given authority, if it deemed best, to place advanced Latin examinations on Thursday morning and the Greek examination on Saturday afternoon.

PROPOSED SIMPLIFICATION IN LATIN

President Neilson inquired whether, in view of the tendency in all the board's examinations toward simplification, the Latin examinations, of which there are eleven, could be cut down. Dean Howes, chairman of the committee on revision in the ancient languages, agreed that such action might well be taken, and the board voted to authorize the committee on examination schedule to deal with the proposed simplification in Latin.

A definition of the requirement in Italian, drawn up in "the form and spirit of recommendations made for French and German by the Committee of Twelve of the Modern Language Association," was presented by Professor Corwin, chairman of the committee of review. With a view to the adoption of this requirement at the meeting of the board next November, the committee was authorized to print and distribute it to those interested. The same action was taken regarding the report of the commission appointed to revise the definition of the chemistry requirement. Upon recommendation of the committee the board voted that the examination in geography "be known in future as physical geography."

NEW TYPE EXAMINATIONS

Reporting for the commission on new types of examinations, Chairman Walter R. Marsh referred to the fact that some questions of the new type have been authorized for the board's history examinations this year and he alluded to a large experiment with the new type questions to be undertaken by the New York Regents. Mr. Marsh said that the board of regents will set papers this June in physics, French, German and Spanish, of which 80 per cent. of the content will be new type questions. A total of 50,000 examination papers will be written in these subjects. Mr. Marsh emphasized that good results can be expected only when new type questions are framed by experts and he cited instances of unhappy results when questions were not well prepared.

Dr. Fiske remarked that he received a great

many inquiries as to what new type examinations are, and he suggested that the commission draw up a definition. The board endorsing this suggestion, Mr. Marsh said that the commission will gladly write a statement describing the new type examinations.

Dr. Wilson Farrand reported, as chairman of the committee on examination ratings, that colleges admitting students on the new plan of the board do not favor giving candidates a direct report on their examination ratings. Dr. Farrand spoke briefly later as a delegate of the board to the National Conference on Uniform Entrance Requirements in English. The conference is making few changes in books required for reading and is moving toward one definite examination in English, Dr. Farrand said, to test both literary appreciation and power of expression.

THE TWENTY-FIFTH ANNIVERSARY CELEBRATION

President Woolley, of Mount Holyoke, who presided as chairman of the meeting, reported for the executive committee and referred to the committee's plan to celebrate next fall the twenty-fifth anniversary of the founding of the College Entrance Board. Some suitable form of celebration is to be devised. It has been suggested, President Woolley said, that this would perhaps be a fitting occasion for the incorporation of the board.

Following the meeting, which was held in the library of Columbia University, the members of the board were the guests of the university for lunch at the Faculty Club.

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EDUCATIONAL RESEARCH AND STATISTICS

THE INTELLECTUAL RESEMBLANCE OF TWINS[1]

PROFESSOR CURTIS MERRIMAN has recently presented to the public a group of valuable data concerning the intelligence of twins. It is the first comprehensive study on the interesting and important subject since the attempt of Thorndike[2] in 1905, and the present investigator has employed better tests of intelligence as well as better statistical methods than those that were available twenty years ago. Scores on the Stanford-Binet, Army Beta, National Intelligence Test and teacher's rating on thirteen intellectual traits are presented for from 76 to 143 pairs of unselected twins, and the results are treated by various methods of statistical analysis. Three general conclusions are stated:

(1) "Environment appears to make no significant difference in the amount of twin resemblance."

(2) "Twins suffer no intellectual handicap."

(3) "There are two distinct types of twins."

The last conclusion is arrived at after a comparison of resemblance between members of like-sex pairs with unlike-sex pairs; the like-sex pairs show much greater resemblance than the unlike-sex pairs, the latter appearing closely similar to siblings. The second conclusion is simply supported by the fact that the mean and median IQ for the twins are practically the same as for the general population. The first conclusion is an inference from the lack of any consistent change of the correlation coefficient from younger twin pairs to older ones. It is the validity of this inference that some people will find difficult to accept.

A few points are here suggested which might have rendered the results of the investigation more conclusive. (1) Reliability measures should have been reported, together with the correlations, so that the cause of the imperfect correlations could properly be divided between chance and true difference of the members of the twin pair. In the present form, the value of the teacher's ratings is especially dubious, as such estimates usually have a rather low reliability. (2) The effect of age should have been taken into consideration. Substantial correlation would be expected, even were unselected children paired for age. With the exception of the Binet scores, where the I.Q. is used, the correlations do not show what proportion of the resemblance is attributed to factors other than

[1] Curtis Merriman, "The Intellectual Resemblance of Twins," Psychological Monographs, 1924, Vol. 33, No. 5, whole No. 152, pp. 58.

[2] "Measurement of Twins," Archives of Philosophy, Psychology and Scientific Methods, 1905, No. 1.

a common age or growth. (3) The range of scores for the different groups should have been mentioned. Otis and Knollin[3] have given an example where the reliability coefficient of the same test had four widely different values (0.85, 0.44, −0.14, −0.62) as groups of different ranges were considered. The correlation coefficients for the different age groups in the present study are therefore hardly comparable and this may account for some apparently irregular results.

From the appendix in the monograph, a calculation was made of the standard deviations of the IQ for the various groups and also the standard errors of estimate. These are presented below, together with the original correlation coefficients.

	r	σ	$\sigma\sqrt{1-r^2}$
All twin pairs	.782	15.1	9.4
Pairs, 5 to 9 years	.809	13.0	7.6
Pairs, 10 to 16 years	.757	16.3	10.6
Like-sex pairs	.867	16.5	8.2
Like-sex, 5 to 9 years	.882	13.4	6.3
Like-sex, 10 to 16 years	.865	18.2	9.1
Girl-girl pairs	.857	15.9	8.2
Girl-girl, 5 to 9 years	.915	15.0	6.1
Girl-girl, 10 to 16 years	.814	15.4	9.0
Boy-boy pairs	.877	16.6	8.0
Boy-boy, 5 to 9 years	.800	9.7	5.8
Boy-boy, 10 to 16 years	.890	19.6	8.9
Unlike-sex pairs	.504	12.4	10.7
Unlike-sex, 5 to 9 years	.774	12.2	7.7
Unlike-sex 10 to 16 years	.298	11.6	11.1

The above table shows that the older twins are a more variable group, except the unlike-sex pairs where correlation is especially low for the older ages. The standard deviations thus balance the irregularities of the correlation coefficients and the resulting standard errors of estimate are singularly consistent, showing in every case an increase of three points from the younger to the older group. Three explanations are possible, (1) the decreasing reliability of the IQ, (2) the increasing variability of the IQ and (3) the increasing effect of the environment from the lower to upper ages. As to which one is true, the data on hand justify no decisive verdict. But a crucial test is practicable. If the first hypothesis holds, results from retesting or dividing the test into two halves will show a greater difference in the IQ for the upper than the lower ages. If the second explanation is true, older children will have a distribution of their IQ with a larger dispersion than the younger children. If both explanations are unable or inadequate to account for the difference, then one can safely conclude that the continued effect of the environment tends to increase the difference between twins.

Finally, a word must be said in regard to a measure of the individual pair resemblance, which the author has derived, presumably imitating a correlation coefficient. Though apparently adaptable from the product-moment formula, the coefficient is none the less an unfortunate vitiating of the Pearson concept. A correlation coefficient is a measure of the accuracy of estimating the positions of the individuals of a population in one variable when their positions are known in another, always with reference to the mean and the standard deviation of the group. When it comes down to a population of one, the essential conditions have evaporated and correlation no longer has meaning. It seems that $(x_1 - x_2/\sigma)$ is an entirely adequate measure of resemblance, perfect resemblance being expressed by zero and increasing differences representable by positive quantities theoretically with no limit. Professor Merriman's formula $1-((x_1-x_2)^2/2\sigma^2)$ successfully transfers the point of perfect resemblance to plus unity, but the zero point does not mean lack of resemblance, nor does minus unity mean complete reversal. In fact, it can be seen that whenever the difference is greater than $\sqrt{2}\sigma$, the value will exceed minus one, as in the case of Pair 78.

The use of this measure, however, does not at all invalidate the conclusion that there are two distinct types of twins. While the final criterion for the mode of genesis of twins must rest with biology, the statistical analysis in this study has at least overthrown the contention of Thorndike that the twin population was a homogeneous one.

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[3] "The reliability of the Binet scale and of pedagogical scales," *Journal of Educational Research*, 1921, IV: 121–142.